

## **An assessment of the economic impact of complying with the copper load allocations assigned to discharges from boats in the Marina del Rey Harbor**

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The implementation of the load allocations assigned to discharges of copper from boat hulls will not only reduce the toxicity of the water in the harbor, but may also reduce the cost of maintaining a vessel docked in the harbor over the long term. While it may be easy to simply focus on a “snap-shot” comparison of the current costs of copper based antifouling paint and non-toxic alternatives, and conclude on this basis, that transitioning to non-toxic alternatives would be a financial burden, this conclusion is not supported as discussed below.

The costs of converting from copper-based paint to a non-toxic coating were estimated in the TMDL Staff Report. When considering the costs it must be kept in mind that regardless of the type of antifouling paint used, boats must routinely be stripped of old hull paint and repainted. Recent studies have reported stripping costs of approximately \$150 per foot. Thus for an average boat length of 40 feet, it costs a boat owner \$6,000 to strip the boat. Most boats must be stripped as part of routine maintenance every 7 to 10 years. Therefore, given the proposed TMDL implementation schedule, paint conversions could be scheduled with planned stripping events, so that no additional stripping costs are incurred by boat owners. In addition, funding may be available to pay for stripping costs when switching to a non-toxic alternative coating, resulting in a savings of \$6,000 to the boat owner.

Setting aside stripping costs, the difference in costs between a boat painted with a copper-based paint and a boat painted with a non-toxic coating is based on the difference in paint costs and hull cleaning costs. Based on analysis presented below, the total difference in cost between a boat painted with a copper-based paint and a boat painted with a non-toxic coating is approximately \$1,573 to \$1,707 per year. However, if funds are made available for stripping as they have been in Shelter Island Yacht Basin, boat owners would actually save money in the first three years.

Further, this is a conservative estimate of the additional cost. In a recent study, economists calculated that any cost savings from using copper paint would decline the longer the owner kept the boat because the copper paint must be replaced more often than a non-toxic epoxy coating (Carson, 2009). In line with this study, the owners of a sailboat that applied a non-toxic epoxy coating in a 2002 field demonstration reported in 2010 that they had saved \$2,940 over anticipated costs for a copper paint over this 8 year period (Johnson et al., 2012).

### Difference in Paint Costs

Copper-based paints are reported to last from three to five years. Based on the analysis below, when spreading the costs over three years, the cost difference is \$133 to \$267 more per year to paint a 40-foot boat with a non-toxic coating. For this analysis, we conservatively assumed that non-toxic and copper-based paints have the same lifespan

of three years to estimate the additional annual costs incurred by owning a boat painted with a non-toxic alternative.<sup>1</sup> Copper-based paints cost about \$100 per gallon. According to local boatyards, epoxy coatings range from two to three times more -- about \$200 to \$300 per gallon. A 40-foot boat is typically covered with 4 gallons. Thus, it costs from \$400 to \$800 more to paint a 40-foot boat with a non-toxic coating, or \$133 to \$267 more per year over the three-year lifespan of the coating.

#### Difference in Hull Cleaning Costs

According to a recent study, hull cleaning of boats with copper-based paint is approximately \$2 per foot and hull cleaning of boats with epoxy paint is approximately \$2.50 per foot (Johnson et al., 2012). Generally, non-toxic paints require more frequent hull cleaning and the hull cleaning is more labor intensive, so it costs more per foot. According to local boatyards, generally boats with non-toxic coatings must be cleaned every two weeks, while boats with copper-based paints must be cleaned every four weeks, though the frequency of cleaning is dependent how much the boat is being used. Thus, in general, for a 40-foot boat, annual costs of boat cleaning are \$960 for copper-based paint and \$2400 for a non-toxic paint – a cost differential of \$1,440.

#### **Cost in context of Overall Ownership Costs**

Taking the conservative estimate calculated above, the additional annual costs of having non-toxic paint on a boat were then compared with other annual costs of maintaining and mooring a boat in Marina del Rey Harbor. For the purposes of this comparison, only slip fees and property taxes on boats were considered, though other costs of ownership were identified in comment letters.

#### Slip Fees

Staff researched four anchorages in Marina del Rey and found slip fees that ranged from \$7,800 to \$11,040 per year for a 40-foot boat.

#### Property taxes on boats

Property taxes on boats moored in Marina del Rey Harbor range depending on the value of the boat. The median price for a boat in Marina del Rey based on current listings<sup>2</sup> is \$119,000 and the tax rate is 1.25%, resulting in an approximate property tax of \$1,488 per year.

#### Conclusion

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<sup>1</sup> Reports vary on the longevity of non-toxic coatings, with some reporting one year and some reporting 10 years.

<sup>2</sup> From Yachtworld.com: Price range from \$12,000 to \$1,250,000, with a median of \$129,000. From Boatstrader.com: Price range from \$2,500 to \$1,500,000, with a median of \$109,900.

Taking into account just the slip fees and property taxes, boaters can spend \$9,288 to \$12,528 to moor their boat in the Marina. This does not account for other costs of mooring and maintaining a boat in Marina del Rey Harbor, such as mechanical service, incidental repairs, fuel, and yacht club fees. As an example, one boater estimated that he spends \$55,300 a year to moor his boat in the Marina (Board package, page 16-434, omitting the boater's estimated spending at restaurants and grocers). In comparison, the additional costs of converting to a non-toxic hull paint are approximately \$1,573 to \$1,707 per year.

Staff anticipates the availability of grant funds, similar to those available in Shelter Island and Newport Bay, which should cover a significant share of the cost in repainting boat hulls. The Regional Board will ensure that paint conversions in Marina del Rey Harbor are identified as a preferred project in the Los Angeles Region to receive Clean Water Act section 319(h) grant funds in upcoming funding cycles. Assuming that grant funding is obtained, given that repainting costs would be incurred whether or not the proposed TMDL is adopted, boaters may in fact spend less money applying a non-toxic coating using grant money than they would reapplying copper-based antifouling paint. In addition, the timeline in the proposed TMDL of ten years incorporates sufficient time to allow boaters to implement paint changes at a time when hull paint would need to be stripped during the course of regular boat maintenance. The timeline also accounts for the capacity of the boat yards in Marina del Rey Harbor to apply hull paints to all boats residing in Marina del Rey Harbor.

The water in Marina del Rey Harbor must meet water quality standards. Staff has proposed the least costly alternative to reduce the amount of dissolved copper in Marina del Rey Harbor in order to meet water quality standards. Without addressing the leaching of copper from boat paints, the water in Marina del Rey would have to be treated in order to meet water quality standards. The volume of water in Marina del Rey Harbor is 6,400,800 m<sup>3</sup>. The cost to treat this volume of water to meet the applicable copper water quality criterion of 3.1 µg/L would far exceed the cost of paint conversions on boats in the Marina.